

MODEL CC-488

GPIB CRATE CONTROLLER

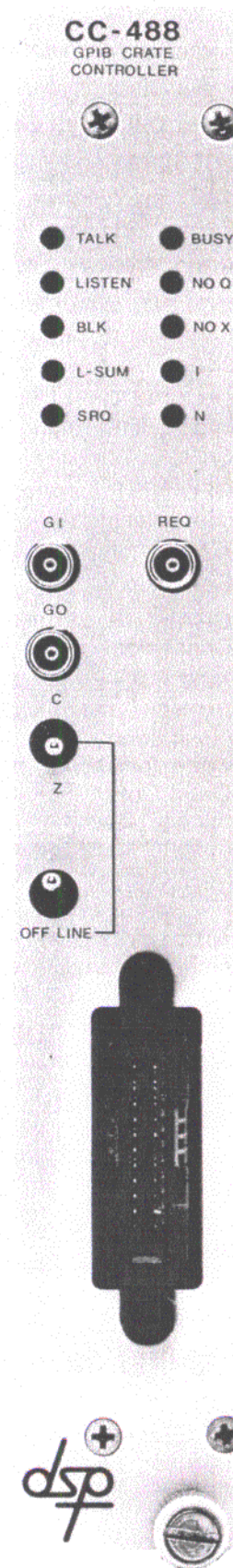


FEATURES

- ◆ High Throughput (650 Kbytes per Second) DMA Data Transfers
- ◆ CAMAC Support Software in Several Popular Programming Languages. Available for IBM XT/AT Compatibles
- ◆ TurnKey Menu-Driven Data Acquisition System Software Available for Set-up, Control, Data Transfer, Display and Analysis
- ◆ Fully Maskable LAM's (Look-At-Me Station Interrupts)
- ◆ Fully Readable Command And Status Registers
- ◆ Maskable Interrupt Sources (SRQ)
- ◆ Selectable Data-Byte Sequence
- ◆ Programmable 24, 16, or 8 bit CAMAC Transfers
- ◆ Programmable Address Scan, Q-Repeat, Q-Stop, and Block Transfer Modes
- ◆ Multiple-crate Operation
- ◆ Conforms to IEEE-488 and IEEE-583 Standards
- ◆ Mailbox Read/Write Register

APPLICATIONS

- ◆ GPIB Controlled System with CAMAC Input/Output Devices
- ◆ Multiple Computer Access to One CAMAC Crate
- ◆ Multiple Computer Bus Control
- ◆ High-speed, High-efficiency, Deterministic Computer Interfacing





MODEL CC-488

DESCRIPTION

The CC-488 is a double-width crate controller for interfacing host computers equipped with IEEE-488 interfaces to the instrument modules installed in a CAMAC crate. The module accepts data and commands from the computer, executes the CAMAC commands and transfers data back to the computer. Direct memory access (DMA) data transfers of up to 650 kbytes per second are supported. Higher level menu driven data acquisition system support software is available separately.

The Model CC-488, in addition to being able to function as a standard crate controller, can also be used as an Auxiliary Crate Controller (ACC). For example, two Model CC-488's can be installed in a single crate at the same time to allow two different computers with IEEE-488 interfaces access to the instrumentation modules. Similarly, a Model CC-488 can be installed along with another model Auxiliary Crate Controller to simultaneously interface a CAMAC crate to both an IEEE-488 ported computer and to another host computer with a different type interface (e.g. DR-11 port, Q-Bus or IBM PC/XT/AT compatible DMA interface).

A Mailbox Register is available, typically used to pass token information between multiple host computers. The CC-488 fully conforms to the IEEE 583-1982 (CAMAC) and IEEE-488-1980 (GPIB) Standards. The combination of both Standards facilitates computer-independent data acquisition and control, as well as simple systems expansion.

The available support software (Model 9101) is for an IBM PC/XT/AT or PS/2 with a National Instruments GPIB interface card installed. Programmed I/O and DMA transfers are supported for the following languages:

BASIC - Microsoft/IBM, Microsoft Quick BASIC

FORTTRAN - IBM, Microsoft, Lahey, Ryan-McFarlane

Pascal - Microsoft, Borland

C - Microsoft, Borland, Lattice

ASYST

Assembly language source code is also provided.



THE CRATE CONTROLLER

The CC-488 supports three CAMAC word-lengths: 24, 16, and 8 Bit. This selection is made by writing to the CC-488 status/mode register.

The user can also select the order of data byte transfer of the CAMAC word. The options are: Most Significant Byte First (HML) and Least Significant Byte First (LMH). The option is switch-selected on the CC-488 with (LMH) as the factory setting.

When installed as an auxiliary crate controller, a single-word, 24 bit mailbox read/write register is available for use by the Dataway. A typical application for this register is providing the ability to pass token information between the hosts of a multicontroller accessed module in a crate without the use of an additional register module.

TRANSFER MODES

The CC-488 has two basic transfer modes: Single Transfer And Block Transfer. Single Transfers are initiated by addressing the CC-488 at its switch-selected GPIB address. This address is always an even number. Block Transfers are initiated by addressing the CC-488 at the single transfer address + 1 (e.g. Single Address = 06; Block Address = 07, the factory default.)

SINGLE TRANSFERS

In the single-transfer mode, the GPIB Controller addresses the CC-488 CAMAC Crate Controller Module as a "Listener", per the GPIB address switch setting on the CC-488, then sends the binary equivalent byte of the CAMAC Station Number (N) as data, followed by the station subaddress (A), followed by the desired CAMAC function code (F). The CC-488 interprets this "NAF" information as a CAMAC Write, Read, or Control Operation, and prepares accordingly.

For a CAMAC Write operation, the GPIB controller sends additional data bytes (binary) in

accordance with the CAMAC word length and sequence selected. When the proper number of bytes has been received, the CC-488 executes a CAMAC cycle, and prepares to receive new "NAF" information. The CC-488 status byte is immediately available if the GPIB controller elects then to address the CC-488 as a Talker and receive the byte.

For CAMAC Read operations, the CC-488 executes a CAMAC cycle and prepares to send the retrieved data. The GPIB Controller then addresses the CC-488 as a "Talker", and receives the data bytes in the word length and sequence format previously selected. GPIB EOI is asserted on the last byte of each valid single transfer. The CC-488 status byte is available as an additional byte if the GPIB controller elects to take it then. Otherwise, the CC-488 prepares to receive new "NAF" information.

For CAMAC control operations, the CC-488 executes a CAMAC cycle and prepares to receive new "NAF" information. Again, the CC-488's status byte is available if the GPIB Controller elects to address the CC-488 as a talker and take it.

BLOCK TRANSFERS

In the Block Transfer Mode, the GPIB Controller addresses the CC-488 as a "Listener" at the Block Transfer Address, then sends the binary equivalent of the desired CAMAC station number (N) as data, followed by the Station Subaddress (A), followed by the desired CAMAC Function Code (F). The CC-488 interprets the "NAF" information as CAMAC Write, Read, or Control operations.

For CAMAC Write operations, the GPIB Controller sends additional bytes according to the selected data format. When the proper number of bytes has been received, the CC-488 executes a CAMAC cycle and prepares to receive additional data bytes to be sent in accordance with the already loaded "NAF" information.

TECHNICAL SPECIFICATIONS - MODEL CC-488



For a CAMAC Read operation, the CC-488 executes a CAMAC cycle and prepares to send the retrieved data. The GPIB Controller then addresses the CC-488 as a "Talker", and accepts the data bytes in the format selected. After the data bytes have been sent, the CC-488 executes the next CAMAC cycle with the loaded "NAF" information and prepares to send that data. For either Read or Write block modes, GPIB EOI will be asserted with the last byte of the transfer where a "NOQ" was received from the addressed module. Both Read and Write Block Modes continue to transfer according to the loaded "NAF" information, until the CC-488 is re-addressed as a "Talker" or "Listener". If the "Address Scan" mode is selected, the N and A Registers will be incremented after each Dataway cycle in accordance with the CAMAC address scan algorithm.

CAMAC control operations are handled in the same manner as in the Single Transfer mode.

LAM AND INTERRUPT MASKING

The Look-At-Me (LAM) register within the CC-488 facilitates the registration of individual local interrupts (LAM's), but permits them to be selectively masked from requesting GPIB controller service. GPIB service request (SRQ) may also be inhibited. These features offer a great latitude in the desired implementation of the user interrupt handling scheme.

COMPUTER COMMANDS

F(0)A(0): Read Command Status Register

F(0)A(2): Read LAM Register

F(0)A(3): Read LAM Enable Register

F(16)A(0): Write Command Status Register

F(16)A(3): Write LAM Enable Register

CC-488 responds to these commands at "Station (N)" = 30

POWER REQUIREMENTS

+ 6V 2400 mA

MATING CONNECTOR/CABLE

MODEL GPIBCABL (not included) is a 6 ft., IEEE #488 standard cable with a standard GPIB connector on both ends.

ACCESSORIES

GPIB Computer Interfaces

GPIB Bus Extender

Model PSP 9101 PC/AT Software Support Package.

PACKAGING

#2 width CAMAC module

221 mm H, 34 mm W, 292 mm D* (8.7" x 1.4" x 11.5")

*Depth front to rear panel. Rear connector 13 mm (0.5").

In conformance with the CAMAC standard for RF shielded instrumentation modules (IEEE standard 583, European Esone Report #EUR4100e).

TEMPERATURE RANGE

0° C to 40° C (32° F to 104° F) ambient to operate within specifications (when installed in crate with enough air flow to hold maximum air exit temperature 55° C (131° F)).

The following are trademarks or registered trademarks of their respective companies: IBM PC/XT/AT & IBM Professional Fortran of International Business Machines Corporation. DEC VAX of Digital Equipment Corporation. Microsoft of Microsoft Corporation, Turbo C and Turbo Pascal of Borland International, Inc. ASYST of Asyst Software Technologies, Inc.